## DUSTSTORMS OF AUGUST-DECEMBER 1936 IN THE UNITED STATES

By R. J. MARTIN

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Despite the dryness of the last 5 months of 1936 in much of the Great Plains area and the Southwest, dust-storms were less frequent and decidedly less severe in character than during some of the preceding months of the year. But while rainfall totals in September averaged from 118 percent to 253 percent of normal in Arizona, Colorado, New Mexico, Kansas, Texas, and Oklahoma, and portions of the States named had above-normal amounts in August, October, November, and December, occasional storms occurred during the autumn and through December, showing that in some southwestern areas the drought is still unrelieved.

While August rainfall was decidedly subnormal in most Plains States and the Southwest, with totals in large areas ranging from less than 10 to 25 percent of normal, dust-storms were fewer than in several other months of 1936. Only a few duststorms were reported, and the frequency seldom exceeded 6 for the month, ranging from 3 or less in the southern Great Plains to about 10 locally in the more northern Plains States. They were most frequent from the 16th to the 23d, though there were a few isolated occurrences early in the month and near the close.

Dust was reported from Idaho eastward to Illinois, and from Oklahoma northward, but only rarely did it reduce visibility to a marked degree, the general average of minimum visibility being from 2 to 5 miles. The most severe local duststorm occurred at Boise, Idaho, on August 2, when visibility was reduced to 25 feet or less for short intervals.

The storms of September were mostly light in character though occasional dense dust was reported in Montana, North Dakota, Nebraska, Colorado, and Oklahoma. Light dust was noted over most western sections from Texas and New Mexico northward and in the upper Mississippi Valley. Light dust was general in eastern Montana and Colorado and in Nebraska and South Dakota. The storms were scattered throughout the month, being reported in each week, but were most frequent from the 17th to the 29th.

The visibility was seldom less than 2 miles, but during the dense storms in those States mentioned above it was considerably less. The first dense storm of the month was reported at Cloud Chief, Okla., on the 1st, where the visibility was reduced at times to 5 yards. Between 4:20 and 4:25 p. m. on the 12th dense clouds of dust about 2,000 feet high were noted along the foothills northeast of Helena, Mont., but only light dust was reported in the city. In northeastern Colorado the storm of the 25th reduced visibility to 300 yards, and at 6:30 p. m. in Denver it was zero while by 9 p. m. the storm had moved on to Pueblo where the visibility was less than one city block; the airport at the latter station reported a maximum wind velocity of 50 miles per hour during this storm. On the same date dense dust occurred at Lincoln, Nebr. Farther north Bismarck, N. Dak., reported a visibility of one-fourth mile at times on the 13th. The dust reported in Colorado on the 23d-25th blew in from the Navajo Indian Reservation in Utah.

During October duststorms were reported from eastern New Mexico and the Texas Panhandle northward to the

Canadian Border, and from the Rocky Mountain States eastward to the middle Mississippi Valley and the Lake region. The storms were generally of light intensity and short duration, and were most frequent on October 9, 10, 17, 20, 28, and 30. On the 30th these storms were general in North Dakota and widespread storms occurred during the month in eastern Montana and South Dakota. The storms of the 30th were classified as the worst of the season in eastern South Dakota; at Huron the visibility was reduced to 1,300 feet, and at Moorhead, Minn., the dust on the 30th was dense from 1 p. m. to 5 p. m., with visibility reduced to one-fourth mile the greater part of the afternoon. Only a few dense occurrences other than the above were reported; in most cases visibility during the height of the storms ranged from 1½ miles to 7 miles. The dust reported at Madison, Wis. was apparently brought from the Dakotas.

During November dust was widespread, being reported from Port Arthur, Tex., to the Canadian Border and from the Rocky Mountains eastward to Chattanooga, Tenn., and Buffalo, N. Y. Most of the storms occurred late in the month, generally from the 19th to the 25th, and ranged in frequency from only one occurrence at some stations to six or more at others, the greatest number being reported in the central and northern Great Plains. Dust was encountered at various altitudes by aviators, the height of the clouds ranging upward to 4,000 feet east of Wichita, Kans., and 6,000 feet at Chicago, Ill., where the visibility was reduced to 3 miles.

General storms were reported in Iowa and the Dakotas, eastern Colorado and New Mexico, Missouri, southwestern Wisconsin, eastern Montana, and eastern Nebraska. In portions of North Dakota street lights were necessary at times when visibility was least. In central South Dakota and portions of Iowa the storms were the worst in 2 years. In general, minimum visibility in the densest storms was one-half mile, but in portions of Nebraska it was reduced to one-fourth mile on the 22d, and to 100 yards on the 24th.

Light dust was reported in the Plains States during December from Oklahoma northward, in some Rocky Mountain sections, and in portions of the upper Mississippi Valley, the frequency ranging from 6 days in the southern plains to 2 or less in the north. On the 28th and 29th the visibility in Baca County, Colo., was reduced to from 50 feet to one-half mile at times from 9 a.m. to 3 p.m. In Sierra, Valencia, and Luna Counties, New Mexico, visibility on the 16th-17th was reduced to 100 feet by local duststorms, and on the 23d rather severe local storms in Roosevelt, Lea, and Eddy Counties reduced visibility to one-half mile from 11 a. m. to 4 p. m. In plains sections of Mora, Colfax, Harding, and Union Counties, New Mexico, visibility was reduced to 100 feet on the 30th from 9 a. m. until sunset. Much topsoil was blown from fields, and in Colfax County it was the most severe storm in several years.

In North Dakota light dust was general on the 19th, and several storms occurred in central Montana where Geraldine (near) reported a "terrific duststorm" from 6 p. m. of the 19th to 3 a. m. of the 20th.